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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/532,173
Filing Date: March 27, 2006
Appellant(s): HERBST, MANFRED

Janet D. Hood
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 14 September 2009 appealing from the Office action mailed 15 April 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,974,633	Hickey	12/1990
WO 02/064422 A1	Olsen	8/2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 11, 12, 15-17 and 19-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hickey (4,974,633) in view of Olsen (WO 02/064422 A1). Hickey discloses a wind power unit comprising: a mast positionable to receive a laminar flow along a path having a direction generally transverse to a direction along which the mast has a variable width, the mast including a maximum width measurable in a direction transverse to the laminar flow; a nacelle; a rotor associated with the nacelle; and a plurality of rotor blades 22/26 having a plurality of recesses to improve flow arranged on the rotor blades approximately in the region between the transition point between laminar and turbulent flow and the final edge of the rotor blade and the shape and configuration of the recesses are designed such that as the air sweeps past the recess, an eddy forms in the recess that assists the passage of the air and accelerates the air volume. Hickey discloses hemispherical recesses that are arranged in a pattern and are the same distance from each adjacent recess as can be seen in example pattern 67.

In regards to claims 19 and 20, it is clearly an obvious matter of engineering design to tailor the structure and control software for the wind turbine unit to a stall speed as modified by the recesses since the modifications would change the operation of the wind turbine unit. Hickey does not disclose having recesses on the mast, gondola or rotor, the recesses being arranged in offset rows, a component surface not being susceptible to dirt and ice or the recesses being on a support material.

In regards to claim 12, the Examiner points out that the since disclosed invention of Hickey is stated as being applied to "one surface of an object in contact with the fluid medium"

(Column 1, lines 36-38) and the mast all have surfaces in contact with the fluid medium it would have been obvious to apply the recesses to any surface of the wind turbine for the purpose of controlling the fluid flow over the surface. Since the recesses can be arranged on the mast the function of "the mast characterized by a transition point along path wherein a flow portion; (i) has predominantly laminar characteristics when traveling towards the transition point, and wherein the transition point is positioned relative to a second point on the mast coinciding with the maximum width such that the flow portion first passes along the second point before passing the transition point" would be inherent to the placing of the recesses on the mast.

Olsen teaches a plurality of offset rows of teardrop shaped recesses (Page 7, lines 13-15; Figure 4) that are applied to a surface of a component interacting with a fluid medium. The recesses reduce drag similar to how Hickey's recesses reduce drag and also reduce susceptibility of the component to dirt and ice (Page 5, lines 6-9). The recesses are configured on a flat support material that is fixed to the component (Page 6, lines 30 to Page 7, line 6). Since both Hickey and Olsen disclose drag reducing recesses to be applied to aerodynamic surfaces, and it is already well known in the art that such applications are interchangeable based on the needs of the application, it would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the recess of Hickey, with the teaches of Olsen as stated above, for the purpose of reducing drag forces on the wind turbine unit.

In regards to new claims 22 and 24, the Examiner holds that position that since the recesses of Hickey, as modified, are capable of performing the function of forming an eddy in the recess that assists the passage of air and accelerates the air volume and reducing turbulence, the function language of both claims is inherently met by the structure disclosed in the prior art.

The Examiner points out that the terms “configured” or "configuration" does not impart any additional structural limitation to the claims above what is explicitly stated in the claim language

Claims 11, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hickey in view of Wobben (6,729,846). Hickey discloses Hickey discloses a wind power unit comprising: a mast positionable to receive a laminar flow along a path having a direction generally transverse to a direction along which the mast has a variable width, the mast including a maximum width measurable in a direction transverse to the laminar flow; a nacelle; a rotor associated with the nacelle; and a plurality of rotor blades 22/26 having a plurality of recesses to improve flow arranged on the rotor blades approximately in the region between the transition point between laminar and turbulent flow and the final edge of the rotor blade and the shape and configuration of the recesses are designed such that as the air sweeps past the recess, an eddy forms in the recess that assists the passage of the air and accelerates the air volume. Hickey further discloses that recesses can be positioned on any surface subject to fluid flow and thus, the recesses can be positioned on the mast to be characterized by a transition point along path wherein a flow portion; (i) has predominantly laminar characteristics when traveling towards the transition point, and wherein the transition point is positioned relative to a second point on the mast coinciding with the maximum width such that the flow portion first passes along the second point before passing the transition point Hickey does not disclose except for the recesses being on a flat film material fixed on or to the wind power unit.

Wobben teaches a wind power unit wherein recesses are configured on a film support material that is fixed to the wind turbine component (Column, 3, lines 56-65). Since both Hickey and Wobben disclose recesses to be applied to aerodynamic surfaces, and it is already

well known in the art that such applications are interchangeable based on the needs of the application, it would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the recess of Hickey, with the teaches of Wobben as stated above, by using a film support material for the purpose of applying surface modifications to an aerodynamic surface.

(10) Response to Argument

With respect to claim 11, Appellant has argued that the prior art does not disclose any recesses of shape in accord with a hemisphere. Appellant goes on to state that the Hickey reference expressly discloses details of a concave indentation that includes a protruding central deviation 46 and protruding deviation sets 48a-48e in Figure 4. The Examiner notes, however that Appellant has failed to recognize that the protruding deviations are only applied to the central concave indentation 32 while the surrounding concave indentions 30a-30e have not protruding deviations (Column 2, lines 36-42). The Examiner thus maintains that Hickey clearly disclose recesses of a shape in accordance with a hemisphere as claimed by Appellant. Furthermore, Figure 7 also shows hemispherical recesses where the secondary pattern is also hemispherical.

Appellant additionally argues that claim 11 requires that, as the air sweeps past a recess: "alternating flow eddies form in the recess that assist with continued laminar flow of the air while also reducing flow resistance along the surface relative to flow in the absence of the recesses...". Appellant indicates that only the Appellant teaches flow eddies formed in the recess and goes on to argue that recesses being hemisphere-like is not the same as being "in accord with the shape of a hemisphere". Appellant thus reasons that the flow eddies are not inherent with

shape of the recesses and thus would not be inherent to the recesses of the prior art. The Examiner respectfully disagrees. To the point of the recess being "hemisphere-like" and not "in accord with the shape of a hemisphere", the Examiner responds that Appellant must not have ***clearly defined*** what is in accord with the shape of a hemisphere aside for stating that the prior art is not in accordance. Based on Appellants disclosure, at best the shape is essentially a curved recess in the surface of structure. This is clearly shown by the prior art. Furthermore, Appellant appears to be giving some special meaning to being "in accord with the shape" that has not been clearly established in the disclosure. If the recess is not "hemisphere-like" how can it possibly be in accord with the shape of hemisphere? The Examiner maintains that the prior art concave indentions are meet the shape limitation based on the broadest reasonable interpretation of Appellant's disclosure. Additionally, Appellant claims not additional structure to create these flow eddies above the aforementioned recesses having a hemispherical shape, so it is clearly inherent to the shape of the recesses that the eddies are formed. The claim language cite by Appellant is all functional and therefore a function of the structure claimed by Appellant. If not then the recesses as claimed by Appellant would be inoperative as they only have the shape claimed by Appellant.

With respect to Olsen, the Examiner notes that this prior art reference is relied upon to teach an offset pattern of recesses, with respect to laminar flow. As Olsen discloses flow control over a surface it is clearly relevant as a prior art teaching.

Ultimately, Appellant argues that since the prior art does not explicitly disclose the same functions as claimed by Appellants claim 11, the structure that is disclosed by the prior and reads on the claimed structure cannot read on the function and thus does not read on the entirety of the

claim. The Examiner respectfully disagrees as the structure claimed is required to perform the function and therefore if the structure is disclosed in the prior art, the structure is inherently capable of performing the function.

With respect to claim 22, Appellant argues the same points as in claim 11. The Examiner's response remains the same.

With respect to claim 25, Appellant similarly argues the points of claim 11. In addition, claim 25 is stated to require "the array [is] ... operatively positioned in a region on the surface along which the air flow passes to cause, in the presence of flowing air, a point along the direction of the air flow at which transition between laminar and turbulent flow occurs under the force of air flow, to be displaced in the direction of the air flow, so that resistance to the air flow is reduced". Appellant contends that there is no basis that is feature is present in the combination of Hickey in view of Olsen and there is no prima facie case of obviousness. The Examiner respectfully disagrees in the as stated in the rejection on page 2, the plurality (i.e. array) of recesses are arranged on the rotor blades approximately in the region between the transition point between laminar and turbulent flow as required by claim 25. The function of the transition point being displaced in the direction of the airflow would in fact be inherent to the structure, i.e. the hemispherical recesses.

With respect to claims 12, 29 and 30, Appellant argues the Examiner used hindsight knowledge of the invention and that the passage from Hickey cited by the Examiner does not provide the support asserted by the Examiner to make the rejection. The Examiner respectfully disagrees. As stated, the at least one surface of the object in contact with the fluid medium is what is intended to be affected by the disclosed invention of Hickey. Furthermore, recesses in

the form on hemisphere (usually referred to as dimples) are not new in the art as clearly shown by Hickey, or new to aerodynamics as such features are used on things such as golf balls to control the air flow as it passes over the surface ball. It would therefore, not be hindsight on the part of the Examiner to glean from the prior art that any surface that is to come in contact with the fluid medium (the mast, nacelle and blades) would also be well within the knowledge of one of ordinary skill in the art to apply a surface treatment.

With respect to claim 15, this feature is similarly addressed as claim 25 above.

With respect to claim 16, Appellant argues that sense the secondary reference teaches teardrop shaped recesses and therefore is inconsistent with Appellants claimed recesses. The Examiner points out, however, that Olsen is relied upon to teach the recesses are in offset rows, to which Appellant does respond. Olsen is clearly showing that an offset pattern is already known in the art.

With respect to claim 17, Appellant argues that Olsen teaches punching of the wall to create a protrusion rather than a recess and therefore cannot read on claim 17. The Examiner respectfully notes that Applicant is arguing only one half of the rejection, the teaching of forming recesses on a separate material to attached to the main surface (the Examiner points out that the wall 61 exhibits a concave cavity 62 downstream). Appellant makes not mention of the primary reference with teaches the concavities. Furthermore, claim 17 only require that the recesses be configured on a flat support material, how the recesses are formed is irrelevant to the claim as recited.

With respect to claims 19 and 20, Appellant has argued that there is not teaching of record to support those rejections. The Examiner respectfully submits the one of ordinary skill in

the art would know make the necessary adjustment to the blades and control software when said person makes aerodynamic changes to the blade surfaces. Furthermore, Appellant's claims recites that these structures are tailored to the modifications caused by the recesses and therefore the modifications would be purely engineering design based on the configuration choice made by the engineer.

With respect to claim 23, Appellant has made arguments similar to those of claims 11 and 22. The Examiner thus responds in the same manner as stated above.

With respect to claim 24, Appellant argues that the rejection does not appear to address this feature, however on page 4, paragraph 2, claim 24 is addressed.

With respect to claim 26, Appellant argues that the recited features are not addressed however the inherency arguments made with respect to claim 11 would not meet this claim since the Hickey reference discloses inconsistent shapes. The Examiner respectfully disagrees and refers back to the above response to the shape of the recesses.

With respect to claims 27 and 28, Appellant argues that since the prior art does not disclose the claimed shape a required in claim 22; the rejection cannot meet the limitations of this dependent claim. The Examiner presumes Appellant is referring to claim 25, from which 22 depends, however in either case, both claims 22 and 25 have been addressed above with respect to the shape of the recesses.

With respect to the rejection of claim 11 in view of Hickey and Wobben, Appellant similarly argues that the shapes of the recesses of Hickey are not in accordance with a hemisphere. The Examiner respectfully disagrees for the same reasons as stated in the above response to claim 11 in view of Hickey and Wobben.

Appellant further argues that the film surface is used to provide a shark skin foil and thus cannot be relied upon to teach adding a surface treatment to a surface using a film. The Examiner respectfully submits that Wobben is relied upon to clearly teach that the use of a film material to provide a surface treatment is already known in the art. It is irrelevant what the shape of Wobben's surface treatment is since the rejection would have been a 102 had the structure of the recesses been the same as those claimed. With respect to the assertion of hindsight, the Examiner notes that some permissible hindsight is necessary in order to search for prior art and is inherent to the Examination process. Wobben clearly shows the film material is known in the art and also clearly uses the film in the same fashion claimed by Appellant. It is unclear to the Examiner what other evidence Appellant thinks is necessary to make the combination outside of the secondary reference explicitly discloses Appellant invention for the exact same function, location and structure, which is not the burden the Examiner has to meet.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Dwayne J White/

Examiner, Art Unit 3745

Conferees:

/Edward K. Look/
Supervisory Patent Examiner, Art Unit 3745

/Thomas Denion/
SPE AU 3748